

## PATENT SPECIFICATION

502,237



Application Date : Sept. 10, 1938. No. 26455/38.  
 (Patent of Addition to No. 434,426. Dated May 20, 1933)  
 Complete Specification Accepted: March 14, 1939.

## COMPLETE SPECIFICATION

## Improvements in or relating to Locking Washers

I, ERNST HERMANN HAUSSER, a German Citizen, of Rotenwaldstrasse 94, Stuttgart, Germany, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

The present invention relates to improvements in or modifications of locking washers as described and claimed in the specification of Patent No. 434,426.

The parent specification describes and claims a locking washer for screws, nuts and the like, having locking teeth which bite into the parts to be secured, in which the edges of pairs of adjacent teeth are formed by the edges of a single incision in the washer which does not extend to either edge of the washer, and are obliquely raised alternatively towards one side and the other of the washer. Thus, in the washer of the parent specification, the edges of the washer itself were not impaired by the formation of the teeth. The locking washers according to the parent specification are completely suitable for the materials generally used at the date of the parent specification. As a result of their fundamentally different properties, newer material also require entirely different locking actions on the part of the screw locking devices and for economic reasons it is generally not possible to produce a suitable and reliable screw locking device for each material and for each type of construction.

By means of the present supplementary invention, the resilient locking washer of the parent specification has been adapted to the purpose of use in materials of special type such as aluminium, brass, synthetic resin and the like, and this is brought about by the fact that, on being angularly bent, the edges of the incisions or slits are shaped to form locking edges which in plan view are arched or inclined on both sides of the centre of the incision away from the original course of the incision.

The result, as has been proved by thorough tests, is that when the locking washer is stressed the shocks to which the screw connection is subjected cause auto-

matic tightening of the locking device.

The invention is more particularly described with reference to the accompanying drawings which illustrate two examples of construction by way of example and in which:—

Figure 1 is a plan view of a locking washer but showing only two incisions.

Figure 2 is an elevation corresponding to Figure 1,

Figure 3 is a view, similar to Figure 1, but illustrating a modified form of washer, and

Figure 4 is an elevation corresponding to Figure 3.

The disc or washer *a* is provided with slits or incisions *b* which have a radial course and which do not reach the edges of the disc. In the example of construction according to Figs. 1 and 2, a second slit perpendicular to the first commences from the middle of the first slit, and runs towards one side thereof, whereby on both sides of the second slit triangular parts remain both of which are angularly bent towards the same side of the disc *a* to form locking teeth. In the case of the succeeding slit, the additional perpendicular slit extends towards the other side and the locking teeth *c* are directed towards the other face.

In the form of construction according to Figs. 3 and 4, the special position of the locking edges is produced by the fact that both edges of the incision or slit *b* are arched out from the plane of the disc towards the same side of the disc *a*, but in such a manner that they do not, as in the main patent, retain their original substantially rectilinear direction in plan view, but are also curved or arched in plan view somewhat as arcs having the original incision lines as chords.

Owing to the fact that in this form of construction also, the edges of one slit are arched out towards one side of the washer and the edges of the next slit are curved towards the other side of the washer, there is again caused, as in the subject of the main patent, that undulation of the washer under load which is essential for the correct operation thereof, and there is produced in the washer a reserve of force

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which makes it possible for the locking teeth to penetrate more and more under vibration or shock, without the occurrence of any harmful play which causes the locking device to become loose.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is:—

1. Improvements in or modifications of the locking washers described and claimed in the specification of Patent No. 434,426, in which on angular bending to form locking edges there is given to the edges of radially directed incisions a direction in which plan view is inclined on both sides of the centre of the incision in the opposite direction to the incision which originally had a radial course.

2. Improvements in or modifications of the locking washers described and claimed in the specification of Patent No. 434,426 in which the edges of the incisions or slits are bent out or shaped to form locking edges which in plan view are arched or inclined on both sides of the centre of the incision away from the original course of

the incision.

3. A locking washer as claimed in claim 1 or 2, in which a second incision perpendicular to the first incision runs sideways from the centre of the first incision, and in which the triangular pieces remaining on both sides of the perpendicular incision are angularly bent out of the plane of the disc towards the same side to form locking teeth.

4. A locking washer as claimed in claim 1 or 2, in which both edges of each radial incision are arched or curved in arcuate form out of the plane of the disc towards the same side in such a manner that in plan view they also curve or arch as arcs having the original incision line as a chord.

5. Improvements in or modifications of the locking washers described and claimed in the specification of Patent No. 434,426 as particularly described with reference to the accompanying drawings.

Dated this 9th day of September, 1938.

W. P. THOMPSON & CO.,  
12, Church Street, Liverpool, 1,  
Chartered Patent Agents.

[This Drawing is a reproduction of the Original on a reduced scale.]

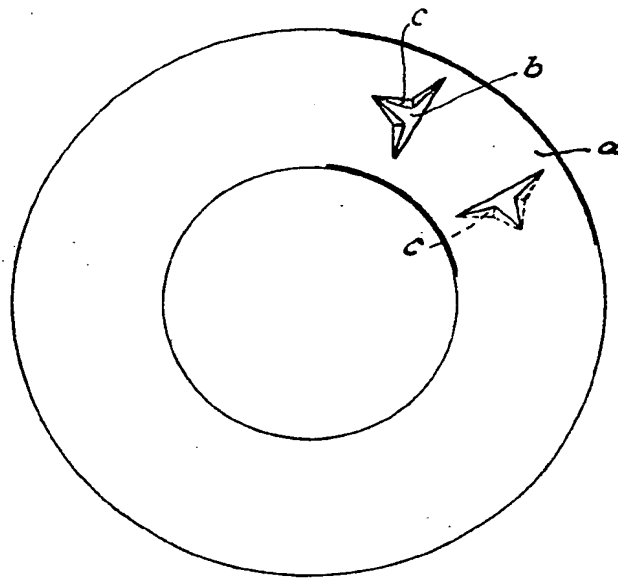


Fig. 1.

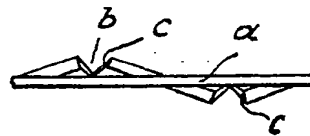


Fig. 2.

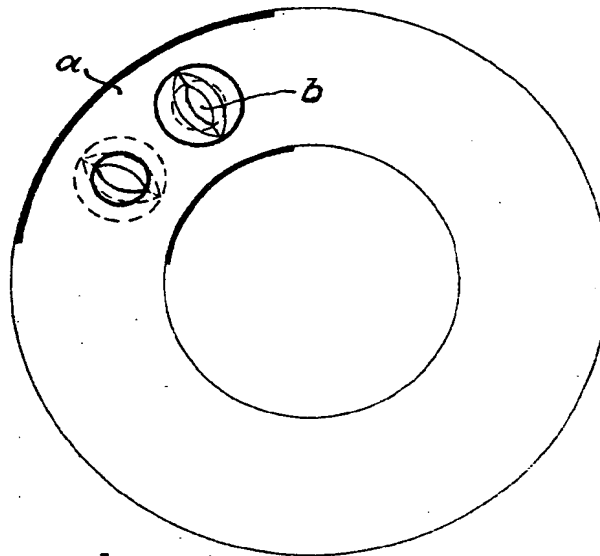


Fig. 3.

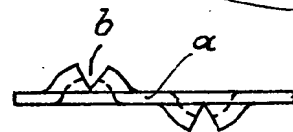


Fig. 4.

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